

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) An apparatus for humidifying a process gas stream, for a fuel cell, the apparatus comprising:

a steam supply line;

a humidification unit having an inlet for the process gas stream and a steam injector connected to the steam supply line, for adding injecting steam into the process gas stream, to add humidity to the process gas stream at a first temperature, to a humidity well in excess of a required humidity level;

a first heat exchanger connected to the humidification unit, for cooling the process gas stream to a second, lower temperature, whereby excess moisture in the process gas stream condenses; and

a separator for removing the condensed moisture, whereby the process gas stream leaving the heat-exchanger separator has a known temperature and a known humidity level; and

a first heater connected to the separator, for heating the process gas stream to a third temperature, greater than the second temperature, whereby the process gas stream has a known absolute humidity level.

2. (cancelled)

3. (cancelled)

4. (currently amended) An apparatus as claimed in claim 12, which includes an outlet line connected to the first heater and an elongate heating means provided for the outlet line, for maintaining the outlet line at the third temperature.

5. (original) An apparatus as claimed in claim 4, where the elongate heating means comprises elongate electrical heating elements.

6. (cancelled)

7. (currently amended) An apparatus as claimed in claim 12, wherein the first heat exchanger includes a first temperature control circuit, for controlling the temperature of the heat exchanger, the first temperature control circuit comprising a conduit for a fluid, a pump for pumping the fluid, and means for cooling the fluid.

8. (original) An apparatus as claimed in claim 7, wherein the first cooling circuit additionally includes a further heater for heating the fluid.

9. (currently amended) An apparatus as claimed in claim 12 or 7, wherein the first heater comprises a second heat exchanger, and wherein the second heat exchanger is provided with a second temperature control circuit for controlling the temperature of the second heat exchanger, the second temperature control circuit comprising a conduit for a second fluid, a pump for circulating the fluid and a third heater for heating the second fluid.

10. (new) An apparatus as claimed in claim 1, wherein the apparatus includes, for another process gas stream of the fuel cell;

another humidification unit including an inlet for the other process gas stream and another steam injector connected to the steam supply line, for injecting steam into the other process gas stream, to add humidity to the other process gas stream at a fourth temperature, to a humidity well in excess of a required humidity level;

a third heat exchanger connected to the humidification unit, for cooling the other process gas stream to a fifth, lower temperature, whereby excess moisture in the other process gas stream condenses;

a second separator for removing the condensed moisture, whereby the other process gas stream leaving the second separator has a known temperature and a known humidity level; and

a second heater connected to the second separator, for heating the other process gas stream to a sixth temperature, greater than the fifth temperature, whereby the other process gas stream has a known absolute humidity level.

11. (new) An apparatus as claimed in claim 10 wherein the steam supply line includes at least one of a shut off valve, a trap for separating out condensed moisture and a pressure regulating valve.

12. (new) An apparatus as claimed in claim 11, wherein the steam line includes two separate lines, one connected to the first-mentioned humidification unit and the other connected to the other humidification unit, wherein each separate steam line includes a shut off valve, a pressure regulating valve and, adjacent the respective steam injector, a non return valve.

13. (new) An apparatus as claimed in claim 10, 11 or 12, wherein each of the first and second heaters comprises a source of cooling fluid connected to the heat exchangers, and wherein each heat exchanger is provided with a respective temperature control circuit for controlling the temperature thereof.

14. (new) An apparatus for humidifying a fuel gas stream and an oxidant gas stream for a fuel cell, the apparatus comprising:

 a fuel gas humidification unit having an inlet for the fuel gas stream and a first steam injector, for injecting steam into the fuel gas stream, to humidify the fuel gas stream at a first temperature to a humidity well in excess of a required humidity level;

 a first, fuel gas heat exchanger connected to the fuel gas humidification unit, for cooling the fuel gas stream to a second, lower temperature, whereby excess moisture in the fuel gas stream condenses;

 a fuel gas separator connected to the first fuel gas heat exchanger, for removing the condensed moisture from the fuel gas;

 a second, fuel gas heat exchanger connected to the fuel gas separator, for heating the fuel gas stream to a third temperature, greater than the second temperature, whereby the fuel gas stream has a known absolute humidity level;

 an oxidant gas humidification unit having an inlet for the oxidant gas stream and a second steam injector, for injecting steam into the oxidant gas stream, to humidify the oxidant gas stream at a third temperature, to a humidity well in excess of a required humidity level;

 a third heat exchanger connected to the oxidant gas humidification unit, for cooling the oxidant gas stream to a fourth, lower temperature, whereby excess moisture in the oxidant gas stream condenses;

an oxidant gas separator connected to the third heat exchanger, for removing the condensed moisture, whereby the oxidant gas stream leaving the second separator has a known temperature and a known humidity level; and

a fourth heat exchanger connected to the oxidant gas separator, for heating the oxidant gas stream to a sixth temperature greater than the fifth temperature, whereby the oxidant gas stream has a known absolute humidity level.

15. (new) An apparatus as claimed in claim 14, wherein the steam line includes first and second separate lines, the first separate line being connected to the fuel gas humidification unit and the second separate line being connected to the oxidant gas humidification unit, and wherein the steam line includes at least one of a cut off valve, a moisture trap and a pressure regulating valve.

16. (new) An apparatus as claimed in claim 15, wherein each of the first and second separate lines includes a pressure regulating valve, a cut off valve and a non return valve, the non return valve being located immediately adjacent the respective humidification unit.
